What is claimed is:

1. Atomic layer deposition (ALD) thin film deposition equipment including a cleaning apparatus, comprising:

a reactor 100 in which a wafer is mounted and a thin film is deposited on the wafer;

a first reaction gas supply portion 210 for supplying a first reaction gas to the reactor 100;

a second reaction gas supply portion 230 for supplying a second reaction gas to the reactor 100;

a first reaction gas supply line 220 for connecting the first reaction gas supply portion 210 to the reactor 100;

a second reaction gas supply line 240 for connecting the second reaction gas supply portion 230 to the reactor 100;

a first inert gas supply line 260 for supplying an inert gas from an inert gas supply source 250 to the first reaction gas supply line 220;

a second inert gas supply line 270 for supplying an inert gas from the inert gas supply source 250 to the second reaction gas supply line 240;

an exhaust line 400 for exhausting the gas within the rector 100 to the outside; and

a cleaning gas supply line 340 connected to the first reaction gas supply line 220 for supplying a cleaning gas for cleaning the reactor 100.

2. The ALD thin film deposition equipment of claim 1, wherein the cleaning gas is ClF_3.

3. The ALD thin film deposition equipment of claim 1, wherein the cleaning gas supply line 340 comprises:

a cleaning gas mass flow controller (MFC) for controlling the flow of a supplied cleaning gas; and

at least one valve for allowing or blocking the flow of the cleaning gas.

4. The ALD thin film deposition equipment of claim 3, wherein the cleaning gas is ClF_3.

5. The ALD thin film deposition equipment of claim 3, wherein the cleaning gas supply line 340 further comprises a filter for filtering out foreign materials existing within the cleaning gas.

6. The ALD thin film deposition equipment of claim 1, wherein the first reaction gas supply portion 210 comprises:

a bubbler 211 for gasifying a first reaction material;

a first reaction gas mass flow controller (MFC) 212 for controlling the flow of a first reaction gas supplied from the bubbler 211; and

a first valve V1 installed on the line between the bubbler 211 and the first reaction gas MFC 212 for allowing or blocking the flow of the first reaction gas.

7. The ALD thin film deposition equipment of claim 6, wherein the first reaction gas is a $TiCl_4$ gas or a compound gas containing Ta, and the second reaction gas is NH_3.

8. The ALD thin film deposition equipment of claim 1, wherein a first reaction gas supply portion 510 comprises:

a thirty first valve V31 for allowing or blocking the flow of a first reaction gas supplied; and

a first reaction gas MFC 512 for controlling the flow of a second reaction gas which has passed through the thirty first valve V31.

9. The ALD thin film deposition equipment of claim 8, wherein the first reaction gas is WF_6, and the second reaction gas is NH_3.

10. The ALD thin film deposition equipment of claim 1, further comprising:

a third reaction supply portion 620 for supplying a third reaction gas to the second reaction gas supply line 240; and

a fourth reaction supply portion 610 for supplying a fourth reaction gas to the second reaction gas supply line 240,

wherein the fourth reaction gas supply portion 610 has a thirty second valve V32 for allowing or blocking the flow of a fourth reaction gas supplied, a fourth reaction gas MFC 612 for controlling the flow of a fourth gas which has passed through the thirty second valve V32, and a thirty third valve V33 for allowing or blocking the flow of a fourth gas which has been controlled by the fourth reaction gas MFC 612.

11. The ALD thin film deposition equipment of claim 10, wherein the third reaction gas supply portion 620 comprises:

a bubbler 621 for gasifying a third reaction material;

a third reaction gas MFC 622 for controlling the flow of the third reaction gas supplied from the bubbler 621;

a thirty fourth valve V34 installed on the line between the bubbler 621 and the third reaction gas MFC 622 for allowing or blocking the flow of the third reaction gas; and

a thirty fifth valve V35 for allowing or blocking the flow of the third reaction gas, which has been controlled by the third reaction gas MFC 622, to the second reaction gas supply line 240.

12. The ALD thin film deposition equipment of claim 10, wherein the first reaction gas is a compound gas containing a transfer metal element such as Ti, Ta or W, the second reaction gas is NH_3, the third reaction gas is TriMethylAluminum (TMA), and the fourth reaction gas is H_2.

13. The ALD thin film deposition equipment of claim 1, wherein the reactor 100 comprises:

a reactor block 110 on which a wafer is mounted;

a shower head plate 120 for maintaining a predetermined pressure constant by covering the reactor block 110;

a diffusion plate installed on the bottom of the shower head plate 120, the diffusion plate having a plurality of spray holes 131 formed over the wafer **w** to spray a first reaction gas and/or inert gas transferred via the first reaction gas supply line 220 onto the upper surface of the wafer **w**, and a plurality of nozzles 133 slanted

toward the inner sidewall of the reactor block 110 to spray a second reaction gas and/or inert gas transferred via the second reaction gas supply line 240; and

a wafer block 140 installed within the reactor block 110, on which the wafer **w** is seated.

14. The ALD thin film deposition equipment of claim 13, wherein a coolant passage 123 is formed in the shower head plate 120 in order to decrease the temperature of the diffusion plate 130 to a desired temperature range.

15. A cleaning method for ALD thin film deposition equipment having a reactor 100 including a reactor block 110 on which a wafer is mounted, a wafer block 140 installed within the reactor block 110, on which the wafer **w** is seated, and a diffusion plate having a plurality of spray holes 131 formed over the wafer block 140 and a plurality of nozzles 133 slanted toward the inner sidewall of the reactor block 110 to spray a gas toward the edges of the wafer block 140, the cleaning method comprising a main cleaning process performed in a state where no wafers are received within the reactor 100, for spraying a mixture of a cleaning gas and an inert gas onto the wafer **w** through the spray holes 131 and spraying an inert gas toward the edges of the wafer block 140 through the nozzles 133.

16. The cleaning method of claim 15, wherein, in the main cleaning process, a cleaning gas flows at 50SCCM or higher, an inert gas is mixed with the cleaning gas and flows to the spray holes 131 at 50SCCM or higher, and an inert gas flows to the nozzles 133 at 300SCCM or higher.

17. The cleaning method of claim 16, wherein, in the main cleaning process, the inside pressure of the reactor 100 is set to be 0.5 to 10 torr.

18. The cleaning method of claim 16, wherein, in the main cleaning process, the inside surface temperature of the reactor 100 except for the wafer block 140 is set to be 200 °C or less.

19. The cleaning method of claim 15, further comprising a sub cleaning process performed in a state where no wafers are received within the reactor, for pulse-introducing the cleaning gas into the reactor 100 to induce instantaneous diffusion due to a pressure fluctuation.

20. The cleaning method of claim 19, wherein, in the sub cleaning process, a cleaning gas flows at 50 SCCM or higher, an inert gas is mixed with the cleaning gas and flows to the spray holes 131 at 50SCCM or higher, and an inert gas flows to the nozzles 133 at 300SCCM or higher.

21. The cleaning method of claim 19, wherein, in the sub cleaning process, the inside pressure of the reactor 100 is set to be 0.5 to 10 torr.

22. The cleaning method of claim 19, wherein, in the sub cleaning process, the inside surface temperature of the reactor 100 except for the wafer block 140 is set to be 200 °C or less.

23. The cleaning method of claim 15, further comprising a pre-coating process performed in a state where no wafers are received within the reactor, for adhering fine particles remaining within the reactor to the inside surface of the reactor.

24. The cleaning method of claim 23, wherein the pre-coating process is performed by mixing the first reaction gas and the inert gas and spraying the gas mixture onto the wafer block through the spray holes 131, and mixing the second reaction gas and the inert gas and spraying the gas mixture toward the edges of the wafer block through the nozzles 133.

25. The cleaning method of claim 23, wherein the pre-coating process is performed by repeating a first step of mixing and introducing the first reaction gas and the inert gas and excluding the first reaction gas for a predetermined period of time, and a second step of introducing the second reaction gas and the inert gas into

the reactor 100 and excluding the second reaction gas for a predetermined period of time.

26. The cleaning method of claim 23, wherein the pre-coating process is performed by repeating a first step of mixing and introducing the first reaction gas and the inert gas and excluding the first reaction gas for a predetermined period of time, while the second reaction gas and the inert gas are continuously introduced into the reactor 100.

27. The cleaning method of claim 23, wherein in the pre-coating process, an NH_3 gas is introduced into the reactor 100 at least several seconds before a first reaction gas is introduced into the reactor 100, when a compound gas containing Cl is used as the first reaction gas, and the NH_3 gas is used as the second reaction gas.

28. The cleaning method of claim 15, wherein the cleaning gas is ClF_3.